PATENT ABSTRACTS

10/5/3 (Item 3 from file: 350) Links
Fulltext available through: Order File History
Derwent WPIX

0015194910 & & *Drawing available*
WPI Acc no: 2005-544509/200556
XRPX Acc No: N2005-446177
Overload e.g. memory overload managing method for e.g. message server, involves monitoring server operation parameter, and evaluating two conditions if parameter passes two threshold values in opposite direction
Patent Assignee: SUN MICROSYSTEMS INC (SUNM)
Inventor: PETIT P

Patent Family (3 patents, 2 & countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
GB 2410580	A	20050803	GB 20051756	A	20050127	200556	B
US 20050198285	A1	20050908	US 2004765828	A	20040127	200559	E
GB 2410580	B	20060419				200626	E

Priority Applications (no., kind, date): US 2004765828 A 20040127

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes
GB 2410580	A	EN	71	15	

Alerting Abstract GB A
NOVELTY - The method involves monitoring successive values of a server operation parameter as a function of time. Two conditions are evaluated if the parameter passes two threshold values in opposite directions. Input server requests are rejected upon verification of a third condition, related to the two former conditions. The rejection is terminated upon verification of a fourth condition, related to the latter condition.
DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

a. an overload manger device for use in server system
b. a computer program product including program instructions executable to implement method of managing overload.

USE - Used for managing overload e.g. central processing unit overload, memory overload in a computer based server system e.g. directory server, message server, application server and portal server.
ADVANTAGE - The method rejects the server requests until enough resource is reclaimed on the server to resume with normal operation, and thus effectively reducing traffic on the server.
DESCRIPTION OF DRAWINGS - The drawing shows a use of access filters at an input of a server.
1 Server system
21, 22 Filters

10/5/5 (Item 5 from file: 350) Links
Fulltext available through: Order File History
Derwent WPIX

0015105807 & & *Drawing available*
WPI Acc no: 2005-455284/200546
XRPX Acc No: N2005-369902
Denial-of-service attack protection stored program, has instructions to reduce new connection request drop rate towards zero if total number of negotiation-pending states of connection requests is less than threshold number
Patent Assignee: MICROSOFT CORP (MICT)
Inventor: SWANDER B D

Patent Family (1 patents, 1 & countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
US 6904529	B1	20050607	US 2000561046	A	20000428	200546	B

Priority Applications (no., kind, date): US 2000561046 A 20000428

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes
US 6904529	B1	EN	9	3	

Alerting Abstract US B1
NOVELTY - The medium stores program to reject new connection requests, if the total number of negotiation-pending states of connection requests reaches a threshold number. A new request drop rate is reduced towards zero if total number of negotiation-pending states is less than threshold number.
DESCRIPTION - An INDEPENDENT CLAIM is also included for method for providing protection against denial-of-service attacks in computer system.
USE - For protection against denial-of-service attacks in computer system.
ADVANTAGE - By reducing the new request drop rate, the resilience of negotiation server to such attacks is significantly enhanced.
DESCRIPTION OF DRAWINGS - The figure shows a flowchart explaining the process of providing protection against denial-of-service attacks.

10/5/20 (Item 20 from file: 350) Links
Fulltext available through: Order File History
Derwent WPIX

0011226417 & & *Drawing available*
WPI Acc no: 2002-165753/200222
XRPX Acc No: N2002-126578
Server monitoring method especially for web servers where periodic requests are made for a URL from a server and if the correct file has not been obtained then an alert is generated
Patent Assignee: LUCENT TECHNOLOGIES INC (LUCE)
Inventor: NAZZARO M; PERRONE A J

Patent Family (2 patents, 27 & countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
EP 1139221	A1	20011004	EP 2000309839	A	20001106	200222	B
JP 2001312429	A	20011109	JP 200188966	A	20010327	200222	E

Priority Applications (no., kind, date): US 2000535210 A 20000327

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes
EP 1139221	A1	EN	11	2	
Regional Designated States,Original	AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR				
JP 2001312429	A	JA	8		

Alerting Abstract EP A1
NOVELTY - Periodically requests URL from a server (102) and if after a preset number of attempts the device cannot connect to the server, is unable to receive requested data, or the requested data is different from the copy stored then an alert is generated. Response times are logged and can be used to monitor load on the web server.
DESCRIPTION - Alert can consist of an email (110), an automatically generated telephone call (115) or by paging (111).
An INDEPENDENT CLAIM is included for a web monitor
USE - Monitoring server faults especially on web servers
ADVANTAGE - Continually monitors the web server.
DESCRIPTION OF DRAWINGS - The drawing shows a block diagram of the web server

10/3,K/1 (Item 1 from file: 350) Links
Fulltext available through: Order File History
Derwent WPIX

0017110912 & & *Drawing available*
WPI Acc no: 2007-825863/200777
XRPX Acc No: N2007-656510
Method of adaptively distributing web server request in system having web servers involves determining particular probability range encompassing random probability number for admitted web server request
Patent Assignee: NORTEL NETWORKS LTD (NELE)
Inventor: AWEYA J; DORAY B J; FELSKE K E; MONTUNO D Y; OUELLETTE M

Patent Family (1 patents, 1 & countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
US 7231445	B1	20070612	US 2000713319	A	20001116	200777	B

Priority Applications (no., kind, date): US 2000713319 A 20001116

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes
US 7231445	B1	EN	16	6	

Original Publication Data by Authority...Claims:having a plurality of web servers, the method comprising the steps of:generating a web server request rejection probability based upon performance measures of each of the plurality of web servers;admitting a web server request if the web server request rejection probability is less than or equal to a predetermined web server request rejection probability threshold, wherein the web server request is admitted before the web server request is sent or... Basic Derwent Week: 200777

10/3,K/21 (Item 21 from file: 350) Links
Fulltext available through: Order File History
Derwent WPIX

0010803632 & & *Drawing available*
WPI Acc no: 2001-419812/200145
XRPX Acc No: N2001-311013
Request processing method involves dealing access request with default procedure even if authentication server does not respond to access request
Patent Assignee: BRITISH TELECOM PLC (BRTE); GRAY R H M (GRAY-I)
Inventor: GRAY R H M

Patent Family (5 patents, 27 & countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
EP 1104133	A1	20010530	EP 1999309560	A	19991129	200145	B
WO 2001041369	A2	20010607	WO 2000GB4551	A	20001129	200145	E
GB 2364410	A	20020123	GB 200029129	A	20001129	200215	E
EP 1234411	A2	20020828	EP 2000979783	A	20001129	200264	E
			WO 2000GB4551	A	20001129		
US 20020188738	A1	20021212	WO 2000GB4551	A	20001129	200301	E
			US 2002130425	A	20020517		

Priority Applications (no., kind, date): EP 1999309560 A 19991129

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes	
EP 1104133	A1	EN	21	10		
Regional Designated States,Original	AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI					
WO 2001041369	A2	EN				
National Designated States,Original	CA US					
Regional Designated States,Original	AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR					
EP 1234411	A2	EN			PCT Application	WO 2000GB4551
					Based on OPI patent	WO 2001041369
Regional Designated States,Original	AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR					
US 20020188738	A1	EN			PCT Application	WO 2000GB4551

Original Publication Data by Authority...Original Abstracts:receive a response, it increments the appropriate counter. When one of the counters reaches a threshold value, the proxy server (24) then follows the default procedure for a pre-set number of requests which would normally be forwarded to the appropriate server. After following the default procedure for this predetermined number of access requests, the proxy server (24) forwards the next access requests, which would normally be forwarded to the relevant server, to that server... ... receive a response, it increments the appropriate counter. When one of the counters reaches a threshold value, the proxy server (24) then follows the default procedure for a pre-set number of requests which would normally be forwarded to the appropriate server. After following the default procedure for this predetermined number of access requests, the proxy server (24) forwards the next access requests, which would normally be forwarded to the relevant server, to that server... ... receive a response, it increments the appropriate counter. When one of the counters reaches a threshold

value, the proxy server (24) then follows the default procedure for a pre-set number of requests which would normally be forwarded to the appropriate server. After following the default procedure for this predetermined number of access requests, the proxy server (24) forwards the next access requests, which would normally be forwarded to the relevant server, to that server...Claims:the event that a predetermined criterion is not satisfied: (i) attempting to forward the access request to an authentication server; (ii) if a response is received from the authentication server, dealing with the access request in accordance with the response; and (iii) if... Basic Derwent Week: 200145

14/5/3 (Item 3 from file: 350) Links
Fulltext available through: Order File History
Derwent WPIX

0015741852 & & *Drawing available*
WPI Acc no: 2006-303672/200632
Related WPI Acc No: 2006-723736; 2007-323195
XRPX Acc No: N2006-257539
Method for facilitating adversary locking in computer system, involves logging threshold number of failed attempt in audit log for imposing global lockout for user identifier to deny access to network application
Patent Assignee: ORACLE INT CORP (ORAC-N)
Inventor: BHATIA G; BISWAS K; SWAMINATHAN A

Patent Family (1 patents, 1 & countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
US 7032026	B1	20060418	US 2001316808	P	20010831	200632	B
			US 200243800	A	20020110		

Priority Applications (no., kind, date): US 2001316808 P 20010831; US 200243800 A 20020110

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes	
US 7032026	B1	EN	7	4	Related to Provisional	US 2001316808

Alerting Abstract US B1
NOVELTY - A request including authentication credential comprising user identifier and network address of user device is received at server. The validity of authentication credential is checked to allow access to network application if the user identifier is locked from the address of user device. A threshold number of failed attempt is logged in the audit log for imposing a global lockout for user identifier to deny access.
DESCRIPTION - An INDEPENDENT CLAIM is also included for computer readable storage medium storing program for facilitating adversary locking.
USE - For facilitating locking of adversary out of a network application of computer system.
ADVANTAGE - Facilitates allowing a legitimate user of an account to access a web-based application while preventing denial of service attack from an adversary.
DESCRIPTION OF DRAWINGS - The figure illustrates the computer system.

14/5/8 (Item 8 from file: 350) Links
Fulltext available through: Order File History
Derwent WPIX

0012713882 & & *Drawing available*
WPI Acc no: 2002-565563/200260
XRPX Acc No: N2002-447684
Network message transmission and reception method for internet telephony, involves resynchronizing received message with sequence number out of sequence to sequence number of received message, when reset bit is set
Patent Assignee: LUCENT TECHNOLOGIES INC (LUCE)
Inventor: NORTON M R; PAJERSKI A S; ROUG A J

Patent Family (1 patents, 1 & countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
US 6411621	B1	20020625	US 1998137955	A	19980821	200260	B

Priority Applications (no., kind, date): US 1998137955 A 19980821

Patent Details

Patent Number	Kind	Lan	Pgs	Draw	Filing Notes
US 6411621	B1	EN	20	7	

Alerting Abstract US B1
NOVELTY - A received message having a sequence number which is out of sequence, is resynchronized to the sequence number of the received message, when reset bit in the received message is set, transmitting host is inactive and predetermined number of reject messages are transmitted by a server to the host.
DESCRIPTION - INDEPENDENT CLAIMS are included for the following:

c. Network message transmitting and receiving apparatus; and
d. Network message transmitting and receiving system.

USE - For transmitting and receiving message for real-time applications e.g. internet telephony, voice telecommunication, etc.
ADVANTAGE - An intermediate reliability protocol is provided with timely delivery of message of low delay characteristics. Thus the requirements of real-time applications are satisfied. Resynchronizations avoid undue delays in message transmission and reception.
DESCRIPTION OF DRAWINGS - The figure shows a flow diagram illustrating the network message transmitting process.

7/3K/1 (Item 1 from file: 348) Links
Fulltext available through: Order File History
EUROPEAN PATENTS

01397534
METHOD AND APPARATUS FOR PREVENTING A DENIAL OF SERVICE (DOS) ATTACK BY SELECTIVELY THROTTLING TCP/IP REQUESTS
GERAT UND VERFAHREN ZUM VORBEUGEN VON DENIAL-OF-SERVICE ANGRIFFEN
PROCEDE ET DISPOSITIF SERVANT A EMPECHER UN REFUS DE SERVICE (DOS) PAR ETRANGLEMENT SELECTIF DE DEMANDES TCP/IP

Patent Assignee:

e. Sun Microsystems, Inc.; (2616582)
901 San Antonio Road, M/S UPAL 01-521; Palo Alto, California 94303; (US)
(Proprietor designated states: all)

Inventor:

f. BELISSENT, Jacques, E.
282 Monroe Drive No.9; Mountain View, CA 94040; (US)

Legal Representative:

g. Alton, Andrew (97091)
Urquhart-Dykes & Lord LLP Tower North Central Merrion Way; Leeds LS2 8PA; (GB)

	Country	Number	Kind	Date	
Patent	EP	1226689	A2	20020731	(Basic)
	EP	1226689	B1	20040714	
	WO	2002001834		20020103	
Application	EP	2001939313		20010522	
	WO	2001US16656		20010522	
Priorities	US	604552		20000626	

Extended Designated States:
AL; LT; LV; MK; RO; SI;

International Patent Class (V7): H04L-012/56; H04L-029/06
NOTE: No A-document published by EPO

Type	Pub. Date	Kind	Text

Publication: English
Procedural: English
Application: English

Available Text	Language	Update	Word Count
CLAIMS B	(English)	200429	1143
CLAIMS B	(German)	200429	1028

CLAIMS B	(French)	200429	1240
SPEC B	(English)	200429	4075
Total Word Count (Document A) 0			
Total Word Count (Document B) 7486			
Total Word Count (All Documents) 7486			

Specification: ...if it is determined that said count of connection requests is not greater than the rejection threshold, then delaying the connection request by a wait time and accepting the request by the server computer.

In another embodiment of the invention an apparatus for preventing a denial of service... ...if it is determined that said count of connection requests is not greater than the rejection threshold; and computer program code for accepting the request by the server computer.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example...

Claims: ...if it is determined that said count of connection requests is not greater than the rejection threshold, then delaying the connection request by a wait time and accepting the request by the server computer (202).

2. A method as recited in claim 1, further comprising:

receiving a second... ...if it is determined that said count of connection requests is not greater than the rejection threshold;

7/3K/2 (Item 2 from file: 348) Links
Fulltext available through: Order File History
EUROPEAN PATENTS

01378115
A SYSTEM AND METHOD FOR DIRECTING RUNTIME DATA IN A SERVER NETWORK
SYSTEM UND VERFAHREN ZUM FUHREN VON LAUFZEITDATEN IN EINEM SERVER-NETZWERK
SYSTEME ET PROCEDE D'ENVOI DE DONNEES OPERATIONNELLES DANS UN RESEAU DE SERVEURS

Patent Assignee:

h. Citrix Systems, Inc.; (2316342)
851 W. Cypress Creek Road; Fort Lauderdale, FL 33309; (US)
(Proprietor designated states: all)

Inventor:

i. FREEMAN, Thomas, D.
9433 South Dunbar Cove; South Jordan, UT 84095; (US)

j. PEDERSEN, Bradley, Jay
7700 South Woodridge Drive; Parkland, FL 33067; (US)

Legal Representative:

k. Simons, Alison (95571)
Dummett Copp 25 The Square Martlesham Heath; Ipswich,Suffolk, IP5 3SL; (GB)

	Country	Number	Kind	Date	
Patent	EP	1297412	A2	20030402	(Basic)
	EP	1297412	B1	20080416	
	WO	2001086414		20011115	
Application	EP	2001931036		20010503	
	WO	2001US14319		20010503	
Priorities	US	567450		20000508	
	US	767774		20010123	
	US	768110		20010123	

Designated States:
AT; BE; CH; CY; DE; DK; ES; FI; FR; GB;
GR; IE; IT; LI; LU; MC; NL; PT; SE; TR;

Extended Designated States:
AL; LT; LV; MK; RO; SI;

Related Divisions: Patent (Application): (EP 2007019613)

International Patent Class (V7): G06F-009/00

IPC	Level	Value	Position	Status	Version	Action	Source	Office
G06F-0009/50	A	I	F	B	20060101	20071025	H	EP

NOTE: No A-document published by EPO

Type	Pub. Date	Kind	Text

Publication: English
Procedural: English
Application: English

Available Text	Language	Update	Word Count
CLAIMS B	(English)	200816	1348
CLAIMS B	(German)	200816	1249
CLAIMS B	(French)	200816	1565
SPEC B	(English)	200816	35036
Total Word Count (Document A) 0			
Total Word Count (Document B) 39198			
Total Word Count (All Documents) 39198			

Specification: ...master has returned the identity of the server that owns the table in question, the requesting server must contact the owner. If the connection attempt fails after a predetermined number of attempts, the requesting server resets its state and requests the zone master to again identify the table owner. This... ...requests. If a failure occurs while attempting to perform one of these operations after a predetermined number of attempts, the requesting server will contact the zone master to request a new owner. This process is executed as...

7/3K/9 (Item 6 from file: 349) Links
Fulltext available through: Order File History
PCT FULLTEXT

00856603
RECURRENT BILLING MAINTENANCE SYSTEM
SYSTEME DE SUIVI DE FACTURATION RECURRENTE

Patent Applicant/Patent Assignee:

l. AMERICAN EXPRESS TRAVEL RELATED SERVICES COMPANY INC; American Express Tower, World Financial Center, New York City, NY 10285-4900 US; US(Residence); US(Nationality)

Legal Representative:

m. SOBELMAN HOWARD I(agent)
Snell & Wilmer L.L.P., One Arizona Center, 400 East Van Buren, Phoenix, AZ 85004-2202; US;

	Country	Number	Kind	Date
Patent	WO	200189924	A2	20011129
Application	WO	2001US17238		20010524
Priorities	US	2000206916		20000525

Designated States: (All protection types applied unless otherwise stated - for applications 2004+)

[EP] AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LU; MC; NL; PT; SE; TR;

[OA] BF; BJ; CF; CG; CI; CM; GA; GN; GW; ML; MR; NE; SN; TD; TG;

[AP] GH; GM; KE; LS; MW; MZ; SD; SL; SZ; TZ; UG; ZW;

[EA] AM; AZ; BY; KG; KZ; MD; RU; TJ; TM;

Publication Language: English
Filing Language: English
Fulltext word count: 5057

Claims:

...19 A computer implemented service according to claim 18, wherein said process server compares the rejection threshold to said tally of the number of rejected merchant process request, said process server further configured reject said merchant process request data file when the rejection threshold is reached.

NPL

15/5/5 (Item 5 from file: 2) Links
Fulltext available through: STIC Full Text Retrieval Options
INSPEC

06344690 INSPEC Abstract Number: B9609-0240C-009, C9609-1140C-010
Title: MAP/G/1 queues under n-policy with and without vacations
Author Kasahara, S.; Takine, T.; Takahashi, Y.; Hasegawa, T.
Author Affiliation: Kyoto Univ., Japan
Journal: Journal of the Operations Research Society of Japan vol.39, no.2 p. 188-212
Publisher: Oper. Res. Soc. Japan ,
Publication Date: June 1996 Country of Publication: Japan
CODEN: JORJA5 ISSN: 0453-4514
SICI: 0453-4514(199606)39:2L.188:QUPW;1-3
Material Identity Number: J183-96003

Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T)
Abstract: This paper considers MAP/G/1 queueing systems under the following two situations: 1) at the end of a busy period, the server is turned off and inspects the queue length every time a customer arrives, and when the queue length reaches a pre-specified value N, the server turns on and serves customers continuously until the system becomes empty; and 2) at the end of a busy period, the server takes a sequence of vacations, and at the end of each vacation the server inspects the queue length, if the queue length is greater than or equal to a pre-specified value N at this time, the server begins to serve customers continuously until the system becomes empty. For each case, we analyze the stationary queue length and the actual waiting time distributions, and derive the recursive formulas to compute the protocols of these distributions. Furthermore, we provide a numerical algorithm to obtain the mass function of the stationary queue length. The numerical examples show that in light traffic, correlation in arrivals leads to a smaller mean waiting time. (14 Refs)
Subfile: B C
Descriptors: Markov processes; operations research; probability; queueing theory
Identifiers: MAP/G/1 queues; queueing theory; queue length; customer arrival; Markovian arrival process; waiting time distributions; protocols; probability
Class Codes: B0240C (Queueing theory); C1140C (Queueing theory); C1290 (Applications of systems theory)

15/5/6 (Item 6 from file: 2) Links
INSPEC

05744769 INSPEC Abstract Number: C9410-1140C-013
Title: Optimal control of the M/G/1 queue with repeated vacations of the server
Author Altman, E.; Nain, P.
Author Affiliation: INRIA, Sophia Antipolis, France
p. 3334-9 vol.4
Publisher: IEEE , New York, NY, USA
Publication Date: 1992 Country of Publication: USA 4 vol. 3822 pp.
ISBN: 0 7803 0872 7
Conference Title: 1992 Conference on Decision and Control
Conference Sponsor: IEEE
Conference Date: 16-18 Dec. 1992 Conference Location: Tucson, AZ, USA

Language: English Document Type: Conference Paper (PA)
Treatment: Theoretical (T)
Abstract: An M/G/1 queue is considered where the server may take repeated vacations. Whenever a busy period terminates, the server takes a vacation of random duration. At the end of each vacation, the server may either take a new vacation or resume service. If the queue is found empty, the server always takes a new vacation. The cost structure includes a holding cost per unit of time and per customer in the system and a cost each time the server is turned on. One discounted cost criterion and two average cost criteria are investigated. It is shown that the vacation policy that minimizes the discounted cost criterion over all policies (randomized, history dependent, etc.) converges to a threshold policy as the discount factor goes to zero. This result relies on a nonstandard use of the value iteration algorithm of dynamic programming, and is used to prove that both average cost problems are minimized by a threshold policy. (23 Refs)
Subfile: C
Descriptors: dynamic programming; optimal control; queueing theory
Identifiers: optimal control; server vacations; policy convergence; M/G/1 queue; cost structure; discounted cost criterion; average cost criteria; threshold policy; value iteration algorithm; dynamic programming
Class Codes: C1140C (Queueing theory); C1180 (Optimisation techniques)

15/5/11 (Item 1 from file: 23) Links
CSA Technology Research Database

0002663450 IP Accession No: 0709991
Optimal adaptive and stochastic control of Markovian systems.

Lin, W Univ. Maryland, Baltimore County, MD, USA
Addl. Source Info: Dissertation Abstracts International Part B: Science and Engineering [DISS. ABST. INT. PT. B - SCI. & ENG.], vol. 44, no. 8, 1984, 105 pp
Publication Date: 1984

Record Type: Abstract
Language: English
Notes: Order No. FAD DA8326955
File Segment: Computer & Information Systems Abstracts

Abstract:
The first part of this dissertation considers the problem of adaptive control of an unknown finite-state, finite-control Markov chain. The only known information about the system is the set of zero-probability transitions. The goal of adaptive control is to achieve a performance equal to the optimal performance attainable if the system is known. The performance of the system is measured by a given long term average cost criterion. The second part of this dissertation considers the optimal control problem for a queueing system which consists of a common queue served by two servers with different service rates. It is assumed that the arrivals to the queue are Poisson and both servers are exponential. It is shown that there exists a threshold policy which minimizes the mean sojourn time of customers in the system. A threshold policy is one which keeps the faster server busy whenever possible and feeds the slower server only when the number of customers in the system exceeds a certain threshold value.

Descriptors: Control systems; Probability; Performance; Queueing theory; Poisson processes
Identifiers: dissertation
Subj Catg: C CM9.4, APPLICATIONS OF SYSTEMS; C CM6, PROBABILITY AND STATISTICS

01160469 ORDER NO: AAD91-15806
SINGLE-SERVER QUEUEING SYSTEMS SUBJECT TO SERVER DETERIORATION

Author: LEE, MING-LUNG
Degree: PH.D.
Year: 1991
Corporate Source/Institution: STANFORD UNIVERSITY (0212)
Adviser: FREDERICK S. HILLIER
Source: Volume 5201B of Dissertations Abstracts International.
PAGE 499 . 119 PAGES
Descriptors: OPERATIONS RESEARCH
Descriptor Codes: 0796

We investigate single-server queueing systems whose servers are subject to sudden deterioration and corrective maintenance. At any time, a server is in one of several possible modes, each corresponding to a certain server condition, and may change to another mode through deterioration or maintenance. We study both descriptive and prescriptive problems. In the descriptive problem, the queueing system is a state-dependent exponential system with a "large queue invariance property" whereby, whenever the queue size exceeds a certain threshold, the arrival and the service rates are constant, the deterioration rate depends only on the server mode, and no maintenance is provided. An "aggregation-partition" approach is used to derive a set of special mean first-passage time (MFPT) equations, which can be solved in conjunction with the conventional MFPT equations for the MFPT from a given system state to a target server mode. In our prescriptive problem, the server has two possible modes, namely, the "good-as-new" and the deteriorated modes. A deterioration affects the service rate and/or the service cost rate. The mode of a deteriorated server can be restored by instantaneous replacement. The system cost consists of the service cost, the customer holding cost and the server replacement cost. The service rate, the deterioration rate and the service cost rate depend on the server mode and idle/busy status. The customer holding cost is a linear function of the queue size. The decision epochs include events of customer arrivals, service completions and server deteriorations. Our optimization criterion is the system's total discounted cost over an infinite horizon. We derive some sufficient conditions for the existence of a monotone increasing optimal stationary policy. In addition, we derive the necessary and sufficient conditions for each of the following stationary policies: always replace the server, never replace it, replace it only when it is busy, and replace it only when it is idle.

IEEE Xplore

[no relevant results]